

1 **A SPIN-VALVE SENSOR WITH PINNING LAYERS COMPRISING**
2 **MULTIPLE ANTIFERROMAGNETIC FILMS**

3 **ABSTRACT OF THE INVENTION**

4 A spin-valve sensor with pinning layers comprising multiple antiferromagnetic films
5 is disclosed. The multiple antiferromagnetic films are preferably selected from the same Mn-
6 based (Ni-Mn or Pt-Mn) alloy system. The Mn content of the antiferromagnetic film in
7 contact with the reference layer of the spin-valve sensor is selected in order to maximize its
8 exchange coupling to the reference layer, thereby providing a high unidirectional anisotropy
9 field for proper sensor operation. The Mn content of the other antiferromagnetic films not
10 in contact with the reference layer of the spin-valve sensor is reduced in order to maximize
11 the thermal stability and corrosion resistance of the spin-valve sensor for robust sensor
12 operation at high temperatures in disk drive environments.

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